REMARKS/ARGUMENTS

By this Amendment, claims 1-5, 11-15, 20, 31, and 32 have been amended. Claims 1-20, 31, and 32 remain pending.

Claims 11 and 20 stand rejected under 35 U.S.C. § 112, first paragraph, on the basis that the subject matter of the claims is not described in the specification. Claims 11 and 20 have been amended. Further, Applicant notes that reduced contact contamination is disclosed, *inter alia*, on page 6, lines 7-10 of the present specification. Withdrawal of the rejection is requested.

Claims 11 and 20 stand rejected under 35 U.S.C. § 112, second paragraph, on the basis of indefiniteness. Claims 11 and 20 have been amended, and are submitted as particularly pointing out and distinctly claiming the subject matter of the invention.

Claims 1-9, 31, and 32 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Appl. No. 2002/0062923 to Forray. Claims 10 and 12-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art in combination with Forray. Applicant respectfully traverses the prior art rejections.

The present invention as recited in amended claim 1 is a semiconductor device including "a solder mask," "a die," and "a partially-cured adhesive layer between said die and said solder mask, wherein said partially-cured adhesive layer remains voidless after outgassing from said solder mask and is partially cured at a temperature below about 100°C." In addition, the device includes "an encapsulant molded over the die."

Amended claim 12 recites a semiconductor device including "a solder mask," "a die," and "electrical contacts on said solder mask and said die, each said contact on said die being wire bonded to a respective said contact on said mask, said electrical contacts being devoid of contamination caused by outgassing from said solder mask." In addition, the device includes "an adhesive layer affixing said die to said solder mask, said adhesive layer

being partially cured at a temperature below 100°C and at a temperature between about 20°C and about 50°C higher than a glassy temperature of said adhesive layer," and "an encapsulant molded over the die."

In contrast, Forray discloses a one-step method of forming an adhesive bond, at a cure peak maximum temperature no greater than about 100°C. Forray does not teach or suggest an encapsulated device having a "partially cured adhesive layer" as recited in independent claims 1 and 12 of the present application.

Applicant's admitted prior art does not remedy the deficiencies of Forray. Applicant's admitted prior art relates to conventional, high-temperature curing of a solder mask adhesive layer. The admitted prior art, taken alone or in combination, does not teach or suggest an encapsulated device having a "partially cured adhesive layer" as recited in claims 1 and 12 of the present application.

Independent claims 1 and 12, and their respective dependent claims 2-11 and 31, and 13-19 and 32, are submitted as being patentable over the prior art references.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"Version with markings to show changes made."**

This amendment has been prepared using the new format requested by the Patent Office for responses filed in Art Unit 1634, 2827, and 2834.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

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Version With Markings to Show Changes Made

1. (Amended) A semiconductor device comprising:

a solder mask;

a die; [and]

a partially-cured [an] adhesive layer between said die and said solder mask, wherein said partially-cured adhesive layer remains voidless after outgassing from said solder mask and is [at least] partially [curable] cured at a temperature below about 100°C; and

an encapsulant molded over the die.

2. (Amended) The semiconductor device of claim 1, wherein said partially-cured adhesive layer is at least fifty percent cured at a temperature below about 100°C.

3. (Amended) The semiconductor device of claim 1, wherein said partially-cured adhesive layer is fully cured at a temperature [below] above about 100°.

4. (Amended) The semiconductor device of claim 1, wherein said adhesive layer is partially cured at a temperature between about 20°C and about 50°C higher than the glassy temperature of said adhesive layer.

5. (Amended) The semiconductor device of claim 4, wherein said adhesive layer is partially cured at a temperature below about 85°C.

6. (Original) The semiconductor device claim 5, wherein said adhesive layer comprises a material with a glassy temperature between about 5°C and about 20°C.

7. (Original) The semiconductor device of claim 6, wherein said adhesive layer comprises bismaleimide.

8. (Original) The semiconductor device of claim 7, wherein said adhesive layer consists essentially of bismaleimide.

9. (Original) The semiconductor device of claim 1, wherein said adhesive comprises initiators which react at a temperature below about 100°C.

10. (Original) The semiconductor device of claim 1, further comprising electrical contacts on said solder mask and said die, each said contact on said die being wire bonded to a respective said contact on said solder mask.

11. (Amended) The semiconductor device of claim 10, wherein said contacts are substantially free of contaminants outgassed from said [adhesive layer] solder mask.

12. (Amended) A semiconductor device comprising:

a solder mask;

a die;

electrical contacts on said solder mask and said die, each said contact on said die being wire bonded to a respective said contact on said mask, said electrical contacts being devoid of contamination caused by outgassing from said solder mask; [and]

an adhesive layer affixing said die to said solder mask, said adhesive layer being [curable] partially cured at a temperature below 100°C and at a temperature between about 20°C and about 50°C higher than a glassy temperature of said adhesive layer; and

an encapsulant molded over the die.

13. (Amended) The semiconductor device of claim 12, wherein said adhesive layer is [at least] partially cured at a temperature below about 100°.

14. (Original) The semiconductor device of claim 13, wherein said adhesive layer is at least fifty percent cured at a temperature below about 100°C.

15. (Amended) The semiconductor device of claim 12, wherein said adhesive layer is cured at a temperature below about 85°C.

16. (Original) The semiconductor device of claim 15, wherein said adhesive layer comprises a material with a glassy temperature between about 5°C and about 20°C.

17. (Original) The semiconductor device of claim 16, wherein said adhesive layer comprises bismaleimide.

18. (Original) The semiconductor device of claim 17, wherein said adhesive layer consists essentially of bismaleimide.

19. (Original) The semiconductor device of claim 12, wherein said adhesive comprises initiators which react at a temperature below about 100°C.

20. (Amended) The semiconductor device of claim 12, wherein said contacts remain relatively free of contaminants released by outgassing from the solder mask during a cure process.

Claims 21-30 (Previously canceled)

31. (Amended) The semiconductor device of claim 1, wherein said adhesive layer is [at least] partially cured at a temperature below about 100°C.

32. (Amended) The semiconductor device of claim 12, wherein said adhesive layer is partially cured at a temperature between about 20°C and about 50°C higher than a glassy temperature of said adhesive layer and said curing temperature is below about 100°C.